What is claimed is:

1. A device for variably attenuating an optical signal comprising:

a waveguide having a cladding and an electro-optical material adjacent to at least a portion of said cladding; and

at least two electrodes to produce an electric field within said electro-optical material,

where the attenuation of light through said waveguide varies with an applied voltage difference to said at least two electrodes.

2. The device of claim 1, wherein the waveguide includes a core having a first refractive index, wherein the cladding has a second refractive index, and wherein the electro-optical material has a third refractive index with a value that varies according to the electric field from the value of the first refractive index to the value of the second refractive index.

3. The device of claim 1, further including a silicon substrate, wherein said electro-optical material is a layer on said substrate.

4. The device of claim 1, wherein said electro-optical material is a substrate.

5. The device of claim 1, wherein said device is a polarization independent device for attenuating an optical signal, wherein said waveguide includes:

a first waveguide;

a second waveguide; and

a transition portion providing optical communication between said first waveguide and said second waveguide,

where said transition portion includes a rotation polarizer to rotate the polarization of light passing between said first waveguide and said second waveguide by 90 degrees.

6. The device of claim 1, wherein said device is a polarization independent device for attenuating an optical signal, wherein said waveguide includes:

a first waveguide having a first electro-optical material;

a second waveguide having a second electro-optical material; and

wherein said first electro-optical material has an ordinary refractive index that is greater than said extraordinary refractive index, and

wherein said second electro-optical material has an ordinary refractive index that is less than said extraordinary refractive index.

7. A device for variably attenuating a plurality of optical signals comprising:

a plurality of waveguides to each attenuate one of said plurality of optical signals, each of said plurality of waveguides having a cladding and an electro-optical material layer adjacent to at least a portion of said cladding; and

at least two electrodes associated with each of said plurality of waveguides, where said at least two electrodes produces an electric field within an associated electro-optical material layer,

where the attenuation of individual ones of said plurality of optical signals varies with an applied voltage difference to an associated at least two electrodes.

8. The device of claim 7, wherein each of the plurality of waveguides includes a core having a first refractive index, wherein the cladding of each of said plurality of waveguides has a second refractive index, and wherein each of the electro-optical materials of the plurality of waveguides has a third refractive index with a value that varies according to the electric field from the value of the first refractive index to the value of the second refractive index.

9. The device of claim 7, wherein said plurality of optical signals are provided to said device in a WDM signal, and further including:

a demultiplexer to accept said WDM signal and provide said plurality of optical signals to said waveguides; and

a multiplexer to accept said plurality of optical signals from said plurality of waveguides and form an attenuated WDM signals.

10. The device of claim 7, further including a silicon substrate, and wherein said electro-optical material is a layer on said substrate.

11. The device of claim 7, wherein said device is a polarization independent device for attenuating a plurality of optical signals, wherein each of said plurality of waveguides includes:

a first waveguide;

a second waveguide; and

a transition portion providing optical communication between said first waveguide and said second waveguide,

where said transition portion includes a rotation polarizer to rotate the polarization of light passing between said first waveguide and said second waveguide by 90 degrees.

12. The device of claim 7, wherein said device is a polarization independent device for attenuating a plurality of optical signals, wherein each of said plurality of waveguides includes:

a first waveguide having a first electro-optical material;

a second waveguide having a second electro-optical material; and

wherein said first electro-optical material has an ordinary refractive index that is greater than said extraordinary refractive index, and

wherein said second electro-optical material has an ordinary refractive index that is less than said extraordinary refractive index.

13. The device of claim 7, wherein said electro-optical material is a substrate.

14. A device for variably attenuating a plurality of optical signals each between an input and an output comprising:

a plurality of waveguides, where each of said plurality of waveguides controllably attenuates one of said plurality of optical signals, and includes

a core between an input and an output, and having a first refractive index,

a cladding surrounding a substantial length of said core and having a second refractive index different from said first refractive index,

an electro-optical material surrounding at least a portion of said cladding, and

at least two electrodes to produce an electric field within said electro-optical material,

where the attenuation of each of said plurality of optical signals is individually varied by an applied voltage difference to corresponding ones of said at least two electrodes.

15. The device of claim 14, wherein each electro-optical material has a third refractive index with a value that varies according to the electric field from the value of the first refractive index to the value of the second refractive index.

16. The device of claim 14, wherein said electro-optical material has a third refractive index variable by said electric field between the value of said first refractive index to the value of said second refractive index.

17. The device of claim 14, wherein said plurality of optical signals are provided to said device in a WDM signal, and further including:

a demultiplexer to accept said WDM signal and provide said plurality of optical signals to said waveguides; and

a multiplexer to accept said plurality of optical signals from said plurality of waveguides and form an attenuated WDM signals.

18. The device of claim 14, further including a silicon substrate, and wherein said electro-

optical material is a layer on said substrate.

19. The device of claim 14, wherein said electro-optical material is a substrate.

20. The device of claim 14, wherein said device is a polarization independent device for attenuating a plurality of optical signals, wherein each attenuator includes:

a first attenuator ;

a second attenuator ; and

a transition portion providing optical communication between said first attenuator and said second attenuator ,

where said transition portion includes a rotation polarizer to rotate the polarization of light passing between said first attenuator and said second attenuator by 90 degrees.

21. The device of claim 14, wherein said device is a polarization independent device for attenuating a plurality of optical signals, wherein each of said plurality of attenuator includes:

a first attenuator having a first electro-optical material;

a second attenuator having a second a second electro-optical material; and

wherein said first electro-optical material has an ordinary refractive index that is greater than said extraordinary refractive index, and

wherein said second electro-optical material has an ordinary refractive index that is less than said extraordinary refractive index.